

REMARKS

The present application was filed on September 30, 2003, with claims 1-17. Claims 1-17 remain pending. Claims 1, 16 and 17 are the independent claims.

Claims 1, 16 and 17 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter.

Claims 1-6, 10 and 13-17 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,745,277 (hereinafter "Lee") in view of U.S. Patent No. 6,907,002 (hereinafter "Beshai").

Claims 7-9, 11 and 12 are indicated as containing allowable subject matter.

In this response, Applicants respectfully traverse the §112 and §103(a) rejections, and amend claims 1, 16 and 17. Applicants respectfully request reconsideration of the present application in view of the remarks below.

The §112 rejection is respectfully traversed, on the ground that the claims are sufficiently clear and definite in their originally-filed form. Nonetheless, claims 1, 16 and 17 have been amended in a manner which is believed to overcome the §112 rejection. More specifically, a broadening amendment has been introduced into each of these claims to replace the "reduces the likelihood of" language objected to by the Examiner with a more general recitation of --avoids--. The amendment removes any need to specify a particular accessing method relative to which a reduction is achieved. Support for the amendment can be found in the specification at, for example, page 10, line 26, to page 11, line 2.

With regard to the §103(a) rejections, Applicants initially note that a proper *prima facie* case of obviousness requires that the cited references when combined must "teach or suggest all the claim limitations," and that there be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references or to modify the reference teachings. See Manual of Patent Examining Procedure (MPEP), Eighth Edition, August 2001, §706.02(j).

Applicants submit that the Examiner has failed to establish a proper *prima facie* case of obviousness in the §103(a) rejection of claims 1-6, 10 and 13-17 over Lee and Beshai, in that the Lee and Beshai references, even if assumed to be combinable, fail to teach or suggest all the claim

limitations, and in that no cogent motivation has been identified for combining the references or modifying the reference teachings to reach the claimed invention.

Independent claim 1 is directed to a processor comprising controller circuitry operative to control the storage of a plurality of separate linked list data structures for protocol data units received by the processor. The claim recites that the linked list data structures are storable in memory circuitry associated with the processor, with the memory circuitry being arranged in banks, and the banks being configured to store respective ones of the plurality of separate linked list data structures, such that each of the plurality of banks stores a corresponding one of the plurality of separate linked list data structures.

In an illustrative embodiment of the invention, a processor 102 comprises a controller 120 which interacts with a linked list storage portion 122 of an external memory 106, as shown in FIG. 1 of the drawings. The linked list storage portion 122 is assumed without limitation to comprise a DRAM arranged in a plurality of banks, also referred to as a multi-bank DRAM. Separate linked list data structures are stored in respective memory banks of the multi-bank DRAM, as indicated in FIG. 3A, step 302. Each of a plurality of memory banks of the multi-bank DRAM thus stores a corresponding one of the plurality of separate linked list data structures. See the specification at, for example, page 6, lines 21-26. An example of a storage arrangement of this type is shown in FIG. 3B, which shows four different linked list data structures stored in respective banks denoted Bank 1, Bank 2, Bank 3 and Bank 4. The linked list data structures stored in the multi-bank DRAM are accessed in an alternating manner that advantageously avoids access conflicts between the banks, as indicated in FIG. 3A, step 304.

The Examiner in formulating the §103(a) rejection of claim 1 argues that each and every one of the above-noted limitations of claim 1 is met by the collective teachings of Lee and Beshai. Applicants respectfully disagree.

The Lee reference describes an arrangement involving the interleaving of packets into different memory banks of a multi-bank memory “so that the same memory bank is not used for back-to-back packet reads.” See Lee at column 1, lines 38-53. As acknowledged by the Examiner, the Lee reference fails to teach or suggest the storage of separate linked list data structures in respective banks of a multi-bank memory. In fact, the Lee reference appears to teach directly away

from such an arrangement in that its only reference to linked lists, at column 4, lines 62-63, states as follows regarding the output queues 122 of system controller 100 in FIGS. 1 and 2:

The output queues are used as linked lists for reading packets from memory 114 to associated output ports 86 (FIG. 1).

Thus, the Lee reference apparently does not store any linked list data structure *per se*, but instead uses the output queues themselves as linked lists. Accordingly, it is readily apparent that there is no need in Lee for storage of separate linked list data structures in respective banks of a multi-bank memory as generally recited in claim 1.

The Examiner argues that these fundamental deficiencies of Lee as applied to claim 1 are overcome by the teachings of the Beshai reference. In characterizing the Beshai reference as allegedly meeting certain limitations of claim 1, the Examiner relies primarily on FIG. 5A and column 6, lines 2-6 and 25-35, of Beshai. However, the relied-upon portions of Beshai fail to teach or suggest the limitations as alleged. For example, the data structure 500 in FIG. 5A of Beshai stores multiple records 504 for respective ones of N input ports 202 of a core node 102, with a given one of the records 504 comprising one or more entries 506, and each of the entries 506 storing parameters of a burst transfer request. See Beshai at column 5, lines 53-67. FIG. 5B shows the burst parameters that are stored in a given entry 506, and these burst parameters include a destination 508 of the burst, and a size 510 of the burst. Beshai indicates that “the plurality of entries 506 in each record 504 may be a linked list.”

Applicants respectfully submit that the collective teachings of Lee and Beshai fail to meet the limitations of claim 1. As indicated above, Lee provides no teaching whatsoever regarding storage of separate linked list data structures in respective banks of a multi-bank memory as claimed. Instead, Lee interleaves packets into different memory banks in order to ensure that the same memory bank is not used for back-to-back packet reads. Beshai teaches to store burst transfer request parameters using a linked list data structure. Accordingly, the two references collectively fail to meet the claim limitations regarding storage of separate linked list data structures in respective banks of a multi-bank memory.

Also, the Examiner has failed to identify a cogent motivation for combining Lee and Beshai in the manner proposed. The Examiner provides the following statement of motivation beginning at page 4, last paragraph, of the Office Action:

It would have been obvious to one ordinarily skilled in the art at the time of the Applicant's invention that each of Lee's separate groups of protocol data units can be stored as a separate linked list data structure in a corresponding memory bank, in order to allow dynamic sharing of Lee's memory and reduction of the size of memory required for storing the protocol data units.

The Federal Circuit has stated that when patentability turns on the question of obviousness, the obviousness determination "must be based on objective evidence of record" and that "this precedent has been reinforced in myriad decisions, and cannot be dispensed with." In re Sang-Su Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Moreover, the Federal Circuit has stated that "conclusory statements" by an examiner fail to adequately address the factual question of motivation, which is material to patentability and cannot be resolved "on subjective belief and unknown authority." Id. at 1343-1344. There has been no showing in the present §103(a) rejection of claim 1 of objective evidence of record that would motivate one skilled in the art to combine Lee and Beshai to produce the particular limitations in question. The above-quoted statement of motivation provided by the Examiner appears to be a conclusory statement of the type ruled insufficient in the In re Sang-Su Lee case.

As indicated above, Lee teaches an interleaving arrangement in which packets are written into different memory banks so that the same memory bank is not used for back-to-back packet reads. The Beshai reference relates to storage of burst transfer parameters using a linked list. Thus, one skilled in the art would not be motivated to combine Lee and Beshai in the manner proposed by the Examiner. For example, Lee apparently does not store burst transfer parameters, so the use of the Beshai technique for storage of burst transfer parameters would not seem to be desirable or even applicable in the Lee system. Although Lee makes reference to linked lists, it teaches to use a queue structure, namely output queues 122, to provide such linked lists, and not interleaving across

memory banks as it does with packets. Thus, even if Lee were for some reason to incorporate a linked list of burst transfer parameters as taught by Beshai, Lee would seem to teach that such a linked list should be implemented using a queue structure rather than the multiple bank interleaving approach that is applied to packets. Accordingly, the proposed combination appears to be based primarily on hindsight, with the Examiner attempting to reconstruct the claimed arrangement from disparate references.

Independent claims 16 and 17 include limitations similar to those of claim 1, and are therefore believed allowable for reasons similar to those described above with reference to claim 1.

Dependent claims 2-6, 10 and 13-15 are believed allowable for at least the reasons identified above with regard to claim 1. One or more of these claims are also believed to define separately-patentable subject matter over the cited art.

In view of the foregoing, Applicants believe that claims 1-17 are in condition for allowance, and respectfully request withdrawal of the §112 and §103(a) rejections.

Respectfully submitted,

A handwritten signature in black ink that reads "Joseph B. Ryan". The signature is fluid and cursive, with the first name "Joseph" being more prominent and the last name "Ryan" following in a similar style.

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